



## First report of *Cucurbit aphid-borne yellow virus* infecting bitter gourd (*Momordica charantia*) and spiny gourd (*Momordica dioica*) in Sri Lanka

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The rapid spread of a virus-like disease with severe leaf yellowing symptoms from bitter gourd and spiny gourd fields in Sri Lanka was observed in 2016-2017. Correct identification based on symptoms is difficult due to mixed infections of cucurbit viruses. Therefore, twenty bitter gourd samples and nine spiny gourd samples were selected from five geographically distinct areas in Sri Lanka (Agnukolapelessa, Balangoda, Kirindiwela, Mulathiuv and Thiththapaththara). The plants showed yellowing and thickening of basal leaves, necrosis of older leaves, reduction of plant growth and interveinal chlorosis (Fig. 1). The samples were tested for infection with *Cucurbit chlorotic yellows virus*, *Cucurbit yellow stunting disorder virus* and *Zucchini yellow mosaic virus* by RT-PCR but all results were negative. Additionally, the symptomatic plants were tested by TAS-ELISA using a monoclonal antibody for *Cucurbit aphid-borne yellow virus* (CABYV) (Agdia Inc., USA). The test was positive for CABYV in five bitter gourd and two spiny gourd samples.

In order to confirm the serological results, total RNA was extracted from four of the samples which had tested positive using ELISA, using the size-fractionated silica extraction method (Boom *et al.*, 1990). Virus-specific primers CABYV-CP-5' (5'-CGCGTGGTTGTGGTCAACCC-3') and CABYV-CP-3' (5'-CCYGCAACCGAGGAAGATCC-3') (Bananej & Vahdat, 2008) were used to amplify the coat protein gene of CABYV. An amplicon of approximately 500 bp was obtained from each of the four ELISA-positive samples and none from the symptomless samples. One RT-PCR product from spiny gourd and one from bitter gourd (GenBank Accession No. MH802612) were sequenced. The sequences were identical and a BLAST search showed 99% identity with a CABYV isolate from South Korea (LC413786). Additionally, an infected bitter gourd sample was analysed by electron microscopy. The presence of spherical particles, 25 nm in diameter, was observed in a partially purified preparation

(Rowhani & Stace-Smith, 1979; Waterhouse & Murant, 1981).

CABYV has been reported to generally be present in mixed infection with other viruses, including the viruses tested for in this study and *Beet pseudo-yellow virus*, *Cucumber vein yellowing virus* and *Watermelon mosaic virus*. The significance of mixed infections in disease associated with CABYV in Sri Lanka is unclear and requires further investigation (Kassem *et al.*, 2007). To the best of our knowledge this is the first report CABYV on bitter gourd in Sri Lanka and the first report of its occurrence on spiny gourd in the world.

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Figure 1

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